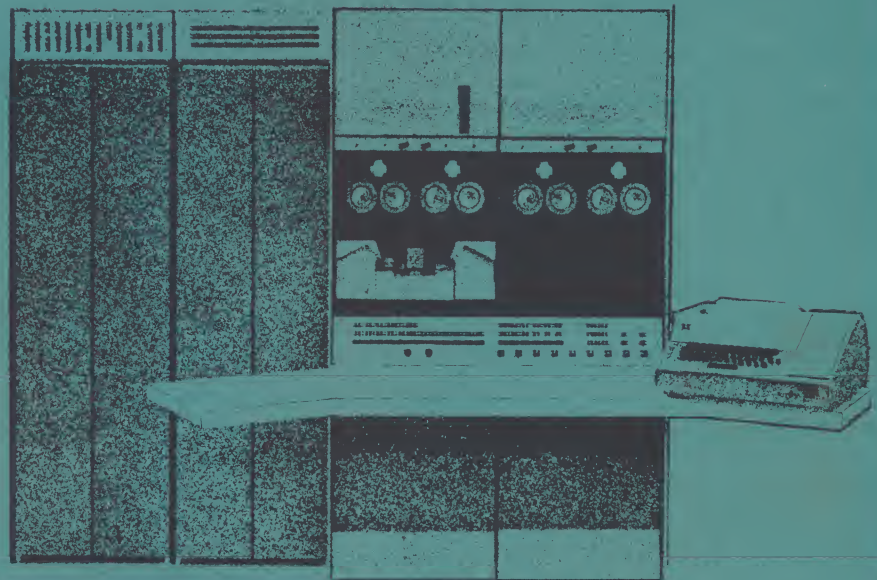


DIGITAL COMPUTERS

Programmed Data Processors 1, 4, 5, 6, and 7 are general purpose, stored program, digital computers capable of a wide variety of data processing and control functions. All are constructed of highly reliable Digital System Modules and include built-in provisions for marginal checking. The resulting overall reliability, calculated from operating logs of numerous installed systems, has earned Programmed Data Processors a reputation for trouble-free performance. An exceptionally varied line of standard and unique input-output devices is available, and powerful control facilities are provided in the computers to handle these and other devices.

Complete programming aids accompany each Programmed Data Processor. The package with each computer includes a compiler and assembler, on-line debugging routines, an editor, and utility, arithmetic, and maintenance routines. Supporting these aids are free-training courses at Digital on the use of the equipment, programming and maintenance manuals, and membership in DECUS, the Digital Equipment Computer Users Society. DECUS provides a medium of information exchange, a library of programs, and regular documentation of DECUS activities. A continuous in-house program design effort produces new and improved software for PDP users.



DIGITAL EQUIPMENT CORPORATION • MAYNARD, MASSACHUSETTS



PDP-1 PDP-1 is capable of both scientific data processing and input-output operations. A large and complete order code has earned PDP-1 a reputation for versatility in a variety of installations. The Sequence Break system allows the operation of the main program concurrent with input-output transfers. Essential hardware for building a time-sharing system is standard equipment.

Among the options for the central processor are: Automatic Multiply and Divide Type 10, which shortens multiply and divide times to 19 and 35 microseconds, respectively; Memory Module Type 12 (4096 words) and Memory Extension Control Type 15, which enables the expansion of memory to 65,536 words; High Speed Channel Control Type 19 and High Speed Data Channel Type 131, which provide direct memory access for high speed devices such as magnetic tape systems; and Multiple Channel Sequence Break, which contains up to 256 channels.

Specifications:

Word Length: 18 bits

Memory: 5 μ sec, 4,096 to 65,536 words

In-Out Transfer: 200,000 words per second

Standard I-O Devices: On-Line typewriter, high speed perforated tape reader and punch

Instructions: 38, expandable as optional equipment is added. Includes multiple-step indirect addressing and Boolean operations. Microinstructions provide 12 variations of arithmetic and logical shifting and 15 basic conditional skip instructions.



PDP-4 PDP-4 can act as the control element in an information processing system or as an independent scientific data processing facility. Its input-output interface, the Real Time Control, allows PDP-4 to control a large and varied assortment of peripheral devices, while its speed, order code, and software system (including FORTRAN II) give the computer a strong data processing capability.

The speed of arithmetic operations can be increased with the optional Extended Arithmetic Element Type 18. Other central processor options include: Memory Module Type 135 (8192 words) and Memory Extension Control Type 16, which enables the expansion of memory up to 32,768 words; and the Automatic Priority Program Interrupt Type 143, which contains 16 channels with priorities for input-output transfers.

Specifications:

Word Length: 18 bits

Memory: 8 μ sec, 4,096 to 32,768 words

In-Out Transfer: 125,000 words per second

Standard I-O Device: High speed perforated tape reader

Instructions: 16, expandable as optional equipment is added. Micro-instructions provide 17 additional operate and conditional functions.

PDP-6 PDP-6 is designed for very high capacity scientific data processing and time sharing. It is a medium sized system with several large machine features (including 16 accumulators and 15 index registers) and provision for expansion to a much larger size. PDP-6 system elements — processors, memories, and input-output equipment — are interconnected by busses and operate asynchronously with respect to each other. As a result, each operates at its own fastest speed, and overall system efficiency and speed are greater than in conventional synchronized systems. PDP-6 contains all of the hardware necessary for time-shared use and an Operating System consisting of a supervisory control program, system programs, and system subroutines. Using the Type 166 Arithmetic Processor, PDP-6 can directly address up to 262,144 locations in memory and can connect to a maximum of 128 input-output controls, some of which may be tied to several devices. No external data channels are required, since the Arithmetic Processor provides the control information and data path for all devices.

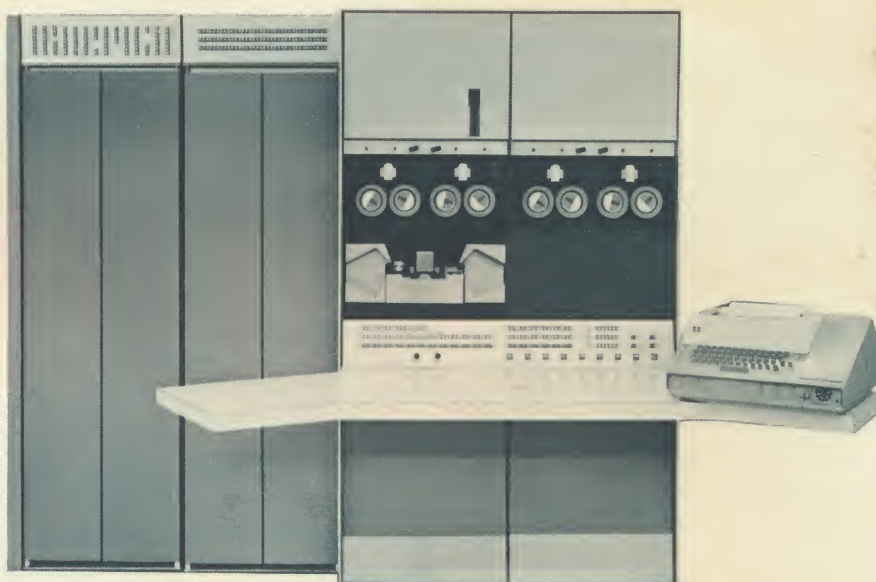
Specifications: (with Type 166 Arithmetic Processor):

Word Length: 36 bits

Memories: Core memory: 2 μ sec, 16,384 to 262,144 words. Fast memory: 0.4 μ sec, 16 words.

Input-Output: Console has provision for a printer-keyboard, perforated tape reader and punch, and Micro Tape dual transports.

Instructions: 363, with extra assignable operations codes. Includes logical or Boolean, memory and accumulator modification and testing, half word, and byte manipulation.



SOFTWARE

All five computers are furnished with complete software. Compilers and assemblers allow the programmer to write his programs in a simplified, pseudo-mathematical form and utilize the computers themselves for rapid assembly into machine language form. PDP-4, 5, 6, and 7 have FORTRAN compilers; PDP-1 has DECAL, an adaptation of ALGOL.

Editing and on-line debugging programs use the same symbolic language as the assembly systems. This means that debugging is carried out in the same language as the program being debugged, eliminating the creation and reassembly of new symbolic tapes each time an error is found.

The arithmetic subroutines include a complete floating point package. Input-output subroutines are prepared for most of Digital's standard optional devices. The maintenance routines provided are extensive.



PDP-5 PDP-5, because of its low cost and high speed, brings the advantages of digital data processing techniques to a broad new market. In spite of its compact size, the basic computer has all of the essential elements of larger systems — random access core memory, arithmetic processor, input-output control (including program and data interrupt), and operator controls and indicators. With these features, PDP-5 can be used either as an independent information handling system or as the control element in larger systems. It can also be used for format conversion and digital training. The input-output interface is extremely flexible and has ample provision for expansion. The optional Automatic Multiply and Divide Type 153 shortens multiplication and division to 102 and 114 microseconds, respectively. Core memory capacity can be increased to 32,768 words in modules of 4096 words with the addition of the Type 154 Memory Extension Control.

Specifications:

Word Length: 12 bits

Memory: 6 μ sec, 4,096 to 32,768 words

In-Out Transfer: 166,000 words per second

Standard I-O Devices: Printer-keyboard with perforated tape reader and punch

Instructions: 8, expandable as optional equipment is added. Micro-instructions provide 17 additional operate and conditional functions.



PDP-7 PDP-7 is the fastest general purpose small computer available. Typical average speeds are: add 3.5 microseconds, multiply 6.1 microseconds (including access), divide 9 microseconds. The combination of this speed with a flexible high capacity input-output control makes the PDP-7 fully capable of scientific data processing. Other features of the system include: 10-megacycle silicon circuitry, 8 auto-indexing memory locations, and 18- or 36-bit arithmetic.

Memory capacity can be increased in increments of 8192 words with Memory Modules Type 149 and the Memory Extension Control Type 148. The Extended Arithmetic Element Type 177 adds 23 microcoded instructions, including automatic multiply, divide, normalize, and long shift. The Automatic Priority Program Interrupt Type 172 provides 16 levels of interrupt and includes an individual channel enable/disable register.

Specifications:

Word Length: 18 bits

Memory: 1.75 μ sec, 4096 to 32,768 words

In-Out Transfer: 570,000 words per second

Standard I-O Devices: Printer-keyboard, high speed perforated tape reader and punch.

Instructions: 16, expandable as optional equipment is added. Micro-instructions provide 17 additional operate and conditional functions.

INPUT-OUTPUT OPTIONS

DISPLAY AND PLOTTING EQUIPMENT

Precision, ultra-precision, incremental and oscilloscope cathode ray tube displays convert digital data into graphic and tabular form. Light Pen detects and identifies plotted points; Symbol Generator plots symbols in four sizes on scope face. Incremental Plotters give hard copy graphs and histograms.

PERFORATED TAPE AND CARD EQUIPMENT

Paper tape punches operate at 10 and 63 characters per second; readers, at 10, 300, and 400. Card punch controls permit operation at 100 or 300 cards per minute; card readers, at 200 or 800.

PRINTERS

Automatic line printers produce hard-copy output data from 300 to 1000 lines per minute, with 120-column lines and any of 64 characters per column. Teleprinters permit on-line inputs and outputs from the control console or remote stations at 10 characters per second.

MAGNETIC TAPE EQUIPMENT

Micro Tape, a new type of fixed address magnetic tape system, provides on-line program debugging or high speed loading and readout. Read-write-search speed is 80 inches per second. Data is recorded redundantly, and the tape bears a permanent timing track for locating desired blocks or words.

Total storage, the equivalent of 4000 feet of perforated tape, is three million bits per reel.

Digital's other magnetic tape units include automatic and programmed controls and high and low density transports. Speeds are 75 and 112.5 inches per second for reading and writing at densities of 200, 556, and 800 bits per inch, giving a range of transfer rates from 15,000 to 90,000 characters per second. Formats are compatible with IBM. Transports include Digital's new electro-pneumatic design for lowest tape stress and wear.

MAGNETIC DRUM SYSTEMS

Drums, controls, and processors provide mass memory capability and direct access to core memory. Sizes range from a 16,384 19-bit-word drum with a 61-microsecond (serial) word transfer time to 1,048,576 36-bit words and a 6.37 -microsecond (parallel) word transfer time.

ANALOG-DIGITAL CONVERTERS

General purpose analog-to-digital converters offer 36 front-panel selections of speed, accuracy, and word length. Maximum speed: 6 bits, 1.6%, 9 μ sec. Maximum accuracy: 11 bits, 0.5%, 88 μ sec. High speed unit converts 10 bits in 5 μ sec. Digital-to-analog equipment has a maximum read-in rate of 400 kc with 12 bits. All speeds may be limited by the computer's memory cycle time.



DUAL MICRO TAPE TRANSPORT



PRECISION CRT DISPLAY WITH LIGHT PEN

digital

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